

REMARKS

In view of the following discussion, none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. §103. Thus, all of the claims are now in condition for allowance.

I. REJECTION OF CLAIMS 1-13, 15-22 AND 24-27 UNDER 35 U.S.C. §103

A. Claims 1-3, 6, 7, 12, 13, 15, 18, 21 and 24

The Examiner rejected claims 1-3, 6, 7, 12, 13, 15, 18, 21 and 24 as being unpatentable under 35 U.S.C. § 103 over Freeburg (U.S. Patent No. 4,850,032, issued July 18, 1989, hereinafter referred to as "Freeburg") in view of Bi, et al. (U.S. Patent No. 5,970,414, issued on October 19, 1999, hereinafter referred to as "Bi") and alleged admitted prior art. The rejection is respectfully traversed.

Freeburg discloses a data communication system that communicates messages by way of a radio frequency channel between a network control processor (NCP 102) and subscriber radios (190). (See Freeburg, Abstract).

Bi disclose a method for estimating a mobile telephone's location. The method uses forward link power control. (See Bi, Abstract). The base station calculates the mobile telephone's location. (See Bi, FIG. 5A, col. 6, l. 56 – col. 7, l. 6).

The Examiner's attention is directed to the fact that Freeburg, Bi and the alleged admitted prior art, alone or in any permissible combination, fail to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. Specifically, independent claims 1, 18, 21 and 24 respectively recite:

1. A method for determining a location of a mobile station, comprising:
 - receiving at the mobile station a plurality of simulcast signals having substantially identical information from a plurality of base stations;
 - determining relative time of arrival information for the plurality of simulcast signals that is received;
 - determining a position of the mobile station by the mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response; and

transmitting the position from the mobile station to one of the plurality of base stations. (Emphasis added).

18. A method for receiving location information for a mobile station at a base station, comprising:

transmitting simulcast signals having substantially identical information to the mobile station; and

receiving, at the base station, mobile station location information from the mobile station determined from relative time of arrival information for the simulcast signals, wherein the mobile station location information is determined by the mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. (Emphasis added).

21. A mobile station, comprising:

a receiver for receiving simulcast signals having substantially identical information from a plurality of base stations;

a processor for determining time of arrival information for the simulcast signals that are received and identifying a location of the mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response; and

a transmitter for transmitting the location to one of the plurality of base stations. (Emphasis added).

24. A wireless network for providing location specific information, comprising:

a mobile station for receiving simulcast signals and determining a location of the mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response; and

a plurality of base stations for transmitting the simulcast signals having substantially identical information and receiving the location of the mobile station transmitted from the mobile station. (Emphasis added).

In one embodiment of the present disclosure, a method is provided for determining the location of a mobile station utilizing simulcasted signals that are transmitted from a plurality of base stations. Simulcasting is the transmission of a particular signal from a plurality of base stations at the same moment in time. Specifically, simulcasting is described as the "simultaneous transmission of substantially the same information content from multiple base stations" (See e.g., Specification, page 5, paragraph 3). Namely, simulcasting creates an artificial multipath environment that is used by the system of the present disclosure to create diversity. A system is described

that can simulcast simultaneous transmission of substantially identical information from a plurality of basestations BS1-N. With this arrangement, the link performance is improved by simulating multipath. Since the same signal from multiple base stations is received by a mobile station, the difference in path delay results in frequency selective fading with narrow spacing between multipath nulls interacting with the inherent frequency diversity of the OFDM system. (See e.g., Specification, page 6, paragraph 5).

Furthermore, the mobile station is able to determine its location or position from the received simulcasted signals. Namely, the mobile station's location or position is determined or derived by the mobile station itself by using the received simulcasted signals. (See e.g., Specification, page 5, paragraphs 2 and 4; page 6, paragraph 2). This information may be subsequently transmitted from the mobile stations to the base stations and utilized for location specific advertising or multi-casting location specific information. (See *Id.* at p. 11, ll. 1-16).

The alleged combination (as taught by Freeburg) fails to render obvious the independent claims because the alleged combination fails to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. The Examiner concedes that Freeburg and Bi fail to describe or suggest this in the Office Action. (See Office Action, p. 3, ll. 15-17). However, the Examiner asserts that the alleged admitted prior art bridges the substantial gap left by Freeburg and Bi. The Examiner cited the Specification on page 5, line 25 to page 6, line 4 as being the alleged prior art.

The alleged prior art fails to bridge the substantial gap left by Freeburg and Bi because the alleged prior art also fails to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. Contrary to the Examiner's assertion, the sections cited by the Examiner in the Specification only state that obtaining the estimate of the impulse response of the channel is well known to one of ordinary skill in the art. (See Specification, p. 5, ll. 22-24). The Specification does

not admit as being prior art anything with respect to how the channel impulse response is used. Therefore, even if the allegedly admitted prior art was combined with Freeburg and Bi, the combination would still fail to describe or suggest using the channel impulse response to determine a position of the mobile station. In other words, the Examiner has failed to provide any references that would bridge the gap in terms of using the channel impulse response that is obtained to determine a position of the mobile station. Therefore, independent claims 1, 18, 21 and 24 are not rendered obvious by Freeburg, Bi and the alleged admitted prior art.

Dependent claims 2-3, 6, 7, 12, 13 and 15 depend, either directly or indirectly, from claim 1 and recite additional features thereof. As such and for the exact same reasons set forth above, claims 2-3, 6, 7, 12, 13 and 15 are also not rendered obvious by the teachings of Freeburg, Bi and the alleged admitted prior art. Therefore, claims 2-3, 6, 7, 12, 13 and 15 fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. As such, the rejection should be withdrawn.

B. Claims 4, 19, 22, and 25

The Examiner rejected claims 4, 19, 22 and 25 as being unpatentable under 35 U.S.C. § 103 over Freeburg, Bi and the alleged admitted prior art and in further view of Siwiak (U.S. Patent No. 5,537,398, issued on July 16, 1996, hereinafter referred to as "Siwiak"). The rejection is respectfully traversed.

The disclosures of Freeburg, Bi and the alleged admitted prior art are discussed above. Siwiak discloses an apparatus for multi-rate simulcast communications. (See Siwiak, Abstract).

The Examiner's attention is directed to the fact that Freeburg, Bi, the alleged admitted prior art and Siwiak, alone or in any permissible combination, fail to disclose determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response, as positively claimed by independent claims 1, 18, 21, and 24. (See *supra*). As discussed above, Freeburg, Bi and the alleged admitted prior art simply do not describe or suggest determining a position of the mobile station by said mobile station using an

average of a channel impulse response obtained from an estimate of a channel frequency response.

Moreover, Siwiak does not bridge the substantial gap left by Freeburg, Bi and the alleged admitted prior art because Siwiak also fails to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. Thus, for all of the above reasons, the combination of Freeburg, Bi, the alleged admitted prior art and Siwiak fails to render obvious independent claims 1, 18, 21, and 24.

Moreover, dependent claims 4, 19, 22 and 25 depend from independent claims 18, 21 and 24, respectively and recite additional limitations. As such, and for the exact same reason set forth above with regard to the independent claims being patentable over Freeburg, Bi, the alleged admitted prior art and Siwiak, claims 4, 19, 22 and 25 are also patentable over Freeburg, Bi, the alleged admitted prior art and Siwiak and the rejection should be withdrawn.

C. Claims 8, 10 and 11

The Examiner rejected claims 8, 10 and 11 as being unpatentable under 35 U.S.C. § 103 over Freeburg, Bi and the alleged admitted prior art in view of Watters, et al. (U.S. Patent No. 5,982,324, issued November 9, 1999, hereinafter referred to as "Watters"). The rejection is respectfully traversed.

The disclosures of Freeburg, Bi and the alleged admitted prior art are discussed above. Watters discloses the combination of GPS with TOA/TDOA of cellular signals to locate a terminal. (See Watters, Abstract)

The Examiner's attention is directed to the fact that Freeburg, Bi, the alleged admitted prior art and Watters, alone or in any permissible combination, fail to disclose determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response, as positively claimed by independent claims 1, 18, 21, and 24. (See *supra*). As discussed above, Freeburg, Bi and the alleged admitted prior art simply do not describe or suggest determining a position of the mobile station using an

average of a channel impulse response obtained from an estimate of a channel frequency response.

Moreover, Watters does not bridge the substantial gap left by Freeburg, Bi and the alleged admitted prior art because Watters also fails to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. Thus, for all of the above reasons, the combination of Freeburg, Bi, the alleged admitted prior art and Watters fails to render obvious independent claims 1, 18, 21, and 24.

Moreover, dependent claims 8, 10 and 11 depend from independent claim 1 and recite additional limitations. As such, and for the exact same reason set forth above with regard to the independent claims being patentable over Freeburg, Bi, the alleged admitted prior art and Watters, claims 8, 10 and 11 are also patentable over Freeburg, Bi, the alleged admitted prior art and Watters and the rejection should be withdrawn.

D. Claim 9

The Examiner rejected claim 9 as being unpatentable under 35 U.S.C. § 103 over Freeburg, Bi and the alleged admitted prior art and in further view of Baum, et al. (U.S. Patent No. 5,867,478, issued February 2, 1999, hereinafter referred to as "Baum"). The rejection is respectfully traversed.

The disclosures of Freeburg, Bi and the alleged admitted prior art are discussed above. Baum discloses a synchronous coherent orthogonal frequency division multiplexing system. (See Baum, Abstract)

The Examiner's attention is directed to the fact that Freeburg, Bi, the alleged admitted prior art and Baum, alone or in any permissible combination, fail to determine a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response, as positively claimed by independent claims 1, 18, 21, and 24. (See *supra*). As discussed above, Freeburg, Bi and the alleged admitted prior art simply do not describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response.

Moreover, Baum does not bridge the substantial gap left by Freeburg, Bi and the alleged admitted prior art because Baum also fails to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. Thus, for all of the above reasons, the combination of Freeburg, Bi, the alleged admitted prior art and Baum fails to render obvious independent claims 1, 18, 21, and 24.

Moreover, dependent claim 9 depends from independent claim 1 and recites additional limitations. As such, and for the exact same reason set forth above with regard to the independent claims being patentable over Freeburg, Bi, the alleged admitted prior art and Baum, claim 9 is also patentable over Freeburg, Bi, the alleged admitted prior art and Baum and the rejection should be withdrawn.

E. Claims 16 and 17

The Examiner rejected claims 16 and 17 as being unpatentable under 35 U.S.C. § 103 over Freeburg, Bi and the alleged admitted prior art and in further view of Oren (U.S. Patent No. 6,725,045, issued on April 20, 2004, hereinafter referred to as "Oren"). The rejection is respectfully traversed.

The disclosures of Freeburg, Bi and the alleged admitted prior art are discussed above. Oren discloses a method and system for locating people and routing telephone calls to telephone stations selected by the called party. According to some embodiments of the present invention, the system may include wireless personal units and a location and routing unit adapted to locate the personal units and to route an incoming call intended for a telephone user associated with a particular personal unit to any one of the telephone stations selected by the telephone user (See Oren, Abstract).

The Examiner's attention is directed to the fact that Freeburg, Bi, the alleged admitted prior art and Oren, alone or in any permissible combination, fail to disclose determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response, as positively claimed by independent claims 1, 18, 21, and 24. (See *supra*). As discussed above, Freeburg, Bi and the alleged admitted prior art simply do not describe

or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response.

Moreover, Oren does not bridge the substantial gap left by Freeburg, Bi and the alleged admitted prior art because Oren also fails to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. Thus, for all of the above reasons, the combination of Freeburg, Bi, the alleged admitted prior art and Oren fails to render obvious independent claims 1, 18, 21, and 24.

Moreover, dependent claims 16 and 17 depend from independent claim 1 and recite additional limitations. As such, and for the exact same reason set forth above with regard to the independent claims being patentable over Freeburg, Bi, the alleged admitted prior art and Oren, claims 16 and 17 are also patentable over Freeburg, Bi, the alleged admitted prior art and Oren. As such, the rejection should be withdrawn.

F. Claims 20 and 26

The Examiner rejected claims 20 and 26 as being unpatentable over Freeburg, Bi, the alleged admitted prior art and Siwiak and further in view of the Oren under 35 U.S.C. § 103. The rejection is respectfully traversed.

The disclosures of Freeburg, Bi, the alleged admitted prior art, Siwiak and Oren are discussed above.

The Examiner's attention is directed to the fact that Freeburg, Bi, the alleged admitted prior art, Siwiak and Oren, alone or in any permissible combination, fail to disclose determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response, as positively claimed by independent claims 1, 18, 21, and 24. (See *supra*). As discussed above, Freeburg, Bi, the alleged admitted prior art and Siwiak simply do not describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response.

Moreover, Oren does not bridge the substantial gap left by Freeburg, Bi, the alleged admitted prior art and Siwiak because Oren also fails to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. Thus, for all of the above reasons, the combination of Freeburg, Bi, the alleged admitted prior art, Siwiak and Oren fails to render obvious independent claims 1, 18, 21, and 24.

Moreover, dependent claims 20 and 26 depend from independent claims 18 and 24, respectively and recite additional limitations. As such, and for the exact same reason set forth above with regard to the independent claims being patentable over Freeburg, Bi, the alleged admitted prior art, Siwiak and Oren, claims 20 and 26 are also patentable over Freeburg, Bi, the alleged admitted prior art, Siwiak and Oren and the rejection should be withdrawn.

G. Claim 27

The Examiner rejected claim 27 as being unpatentable under 35 U.S.C. § 103 over Freeburg, Bi and the alleged admitted prior art and in further view of Oren. The rejection is respectfully traversed.

The disclosures of Freeburg, Bi, the alleged admitted prior art and Oren are discussed above.

The Examiner's attention is directed to the fact that Freeburg, Bi, the alleged admitted prior art and Oren, alone or in any permissible combination, fails to describe or suggest a wireless network comprising a plurality of base stations for transmitting simulcast signals having substantially identical information to mobile stations and receiving mobile station location information derived by the mobile stations using an average of a channel impulse response obtained from an estimate of a channel frequency response from at least one of the mobile stations to broadcast location specific information to the mobile stations. Specifically, independent claim 27 respectively recites:

27. A wireless network, comprising:

a plurality of base stations for transmitting simulcast signals having substantially identical information to mobile stations and receiving mobile station location information derived by the mobile stations using an average of a channel impulse response obtained from an estimate of a channel frequency response from the mobile stations to broadcast location specific information to the mobile stations. (Emphasis added).

In one embodiment of the present disclosure, a method is provided for determining the location of a mobile station utilizing simulcasted signals that are transmitted from a plurality of base stations. Simulcasting is the transmission of a particular signal from a plurality of base stations at the same moment in time. Specifically, simulcasting is described as the "simultaneous transmission of substantially the same information content from multiple base stations" (See e.g., Specification, page 5, paragraph 3). Namely, simulcasting creates an artificial multipath environment that is used by the system of the present disclosure to create diversity. A system is described that can simulcast simultaneous transmission of substantially identical information from a plurality of basestations BS1-N. With this arrangement, the link performance is improved by simulating multipath. Since the same signal from multiple base stations is received by a mobile station, the difference in path delay results in frequency selective fading with narrow spacing between multipath nulls interacting with the inherent frequency diversity of the OFDM system. (See e.g., Specification, page 6, paragraph 5).

Furthermore, the mobile station is able to determine its location or position from the received simulcasted signals. Namely, the mobile station's location or position is determined or derived by the mobile station itself by using the received simulcasted signals. (See e.g., Specification, page 5, paragraphs 2 and 4; page 6, paragraph 2). This information may be subsequently transmitted from the mobile stations to the base stations and utilized for location specific advertising or multi-casting location specific information. (See *Id.* at p. 11, ll. 1-16).

The alleged combination (as taught by Freeburg, Bi and the alleged admitted prior art) fails to render obvious the independent claims because the alleged combination fails to describe or suggest a wireless network comprising a plurality of

base stations for transmitting simulcast signals having substantially identical information to mobile stations and receiving mobile station location information derived by the mobile stations using an average of a channel impulse response obtained from an estimate of a channel frequency response from at least one of the mobile stations to broadcast location specific information to the mobile stations. As discussed above, the combination of Freeburg, Bi and the alleged admitted prior art fails to describe or suggest a wireless network comprising a plurality of base stations for transmitting simulcast signals having substantially identical information to mobile stations and receiving mobile station location information derived by the mobile stations using an average of a channel impulse response obtained from an estimate of a channel frequency response from at least one of the mobile stations to broadcast location specific information to the mobile stations. The Examiner conceded that Freeburg and Bi fail to describe or suggest that a mobile station position is determined by the mobile station. (See Office Action, p. 3, ll. 15-17).

As noted above, the alleged prior art fails to bridge the substantial gap left by Freeburg and Bi because the alleged prior art also fails to describe or suggest determining a position of the mobile station by said mobile station using an average of a channel impulse response obtained from an estimate of a channel frequency response. Contrary, to the Examiner's assertion, the sections cited by the Examiner in the specification only state that obtaining the estimate of the impulse response of the channel is well known to one of ordinary skill in the art. (See Specification, p. 5, ll. 22-24). The Specification does not admit as being prior art anything with respect to how the channel impulse response is used. Therefore, even if the allegedly admitted prior art was combined with Freeburg and Bi, the combination would still fail to describe or suggest using the channel impulse response to determine a position of the mobile station. In other words, the Examiner has failed to provide any references that would bridge the gap in terms of using the channel impulse response that is obtained to determine a position of the mobile station.

Oren also fails to bridge the substantial gap left by Freeburg, Bi and the alleged prior art because Oren also fails to describe or suggest a wireless network comprising a

plurality of base stations for transmitting simulcast signals having substantially identical information to mobile stations and receiving mobile station location information derived by the mobile stations using an average of a channel impulse response obtained from an estimate of a channel frequency response from at least one of the mobile stations to broadcast location specific information to the mobile stations. Oren only discloses a method and system for locating people and routing telephone calls to telephone stations selected by the called party.

Therefore, independent claim 27 is not rendered obvious by Freeburg, Bi, the alleged prior art and Oren. As such, the rejection should be withdrawn.

CONCLUSION

Thus, all of the claims now fully satisfy the requirements of 35 U.S.C. § 103. Consequently, all the claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 542-2280 x130 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully Submitted,



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